

CLAIMS

1 1.(**withdrawn**) A composition comprising a modified nucleotide including a molecular and/or
2 atomic tag, where the nucleotide alters base incorporation fidelity in a nucleotide polymerizing agent
3 relative to a base incorporation fidelity of the agent in the absence of the modified nucleotide.

1 2.(**withdrawn**) The composition of claim 1, wherein the modified nucleotide comprises a β
2 and/or γ phosphate modified nucleotide.

1 3.(**withdrawn**) The composition of claim 1, wherein the modified nucleotide comprises a β
2 phosphate modified nucleotide.

1 4.(**withdrawn**) The composition of claim 1, wherein the modified nucleotide comprises a γ
2 phosphate modified nucleotide.

1 5.(**withdrawn**) The composition of claim 4, wherein the tag comprises a molecule.

1 6.(**withdrawn**) The composition of claim 5, wherein the tag is ANS.

1 7.(**currently amended**) A method for using modified nucleotides to alter base incorporation
2 fidelity comprising the step of adding a modified nucleotide including a molecular tag to a nucleotide
3 polymerization medium comprising a nucleotide polymerizing agent, a primer and a template, where
4 the modified nucleotide ~~alters~~ increases base incorporation fidelity of the nucleotide polymerizing
5 agent relative to a base incorporation fidelity of the nucleotide polymerizing agent in the absence of
6 the modified nucleotide to produce an extended primer having reduced incorrect base incorporations.

1 8.(**original**) The method of claim 7, wherein the modified nucleotide comprises a β and/or γ
2 phosphate modified nucleotide.

1 9.(**original**) The method of claim 7, wherein the modified nucleotide comprises a β phosphate
2 modified nucleotide.

1 10.(original) The method of claim 7, wherein the modified nucleotide comprises a γ phosphate
2 modified nucleotide.

1 11.(canceled) The method of claim 10, wherein the tag comprises a molecular tag.

1 12.(currently amended) The method of claim 10, wherein the tag comprises aminonaphthalene-
2 1-sulfonate (ANS).

1 13.(currently amended) A method for using modified nucleotides to alter base incorporation
2 fidelity comprising the step of adding a modified nucleotide including a molecular tag to an assay
3 for extending a nucleotide sequence, where the modified nucleotide alters base incorporation fidelity
4 of a nucleotide polymerizing agent relative to a base incorporation fidelity of the polymerizing agent
5 in the absence of the modified nucleotide, and the assay is selected from the group consisting of
6 genotyping for *in vitro* reproductive methods (human and other organisms); single nucleotide
7 polymorphism (SNP) detection; DNA sequencing; RNA sequencing; single nucleotide extension
8 assays; amplified DNA product assays; rolling circle product assays; PCR product assays; allele-
9 specific primer extension assays; single-molecule arrays (DNA, RNA, protein) assays; and drug
10 toxicity evaluation assays.

1 14.(withdrawn) A method for making blunt-ended fragments comprising the steps of
2 amplifying a DNA fragment in the presence of a nucleotide including a molecular and/or atomic tag
3 on a γ phosphate group and/or a base moiety, where the tag alters fidelity of base incorporation and
4 decreases or eliminates non-templated addition of a base to the 3' end of the DNA fragment being
5 amplified.

1 15.(currently amended) A kit for performing a nucleotide polymerizing reaction comprising
2 using at least one modified nucleotide including a molecular tag in the presence of a polymerizing
3 agent, a primer and a template, where the modified nucleotide alters polymerizing agent extension
4 fidelity for the at least one modified nucleotide compared to the polymerizing agent extension
5 fidelity in the presence of the unmodified nucleotide corresponding to the at least one modified
6 nucleotide.

1 16.(**withdrawn**) A method of inhibiting or preventing pyrophosphorolysis during synthesis of
2 a nucleic acid molecule, said method comprising
3 (a) combining a primer with a nucleic acid template under conditions sufficient to form a hybridized
4 product; and
5 (b) incubating the hybridized product with a polymerase in the presence or absence of an enzyme
6 selected from the group consisting of a pentosyltransferase, a phosphotransferase with alcohol group
7 as acceptor, a nucleotidyltransferase, and a carboxy-lyase, under conditions sufficient to form a
8 second nucleic acid molecule complementary to all or a portion of the nucleic acid template,
9 where a tagged nucleotide comprises an atomic and/or molecular tag or moiety attached to
10 and/or associated with a β and/or γ -phosphate and/or a base moiety of the nucleotide is added at
11 either or both steps to inhibit or prevent pyrophosphorolysis during synthesis of a nucleic acid
12 molecule.

1 17.(**withdrawn**) A composition comprising a nucleotide including a molecular and/or atomic
2 tag on a phosphate group adapted to alter the fidelity of viral replication.

1 18.(**withdrawn**) The composition of claim 17, wherein the virus is HIV.

1 19.(**withdrawn**) A method for increasing the fidelity of replication comprising administering
2 an therapeutically effective amount of a nucleotide including a molecular and/or atomic tag on a γ
3 phosphate group to an animal including a human, where the nucleotide is designed to increase base
4 incorporation fidelity during replication.

1 20.(**withdrawn**) The method of claim 19, wherein the replication is caused by an HIV virus.

1 21.(**currently amended**) The method of claim 7, wherein the tag is-covalently bonded to the
2 modified nucleotide through a linker.

1 22.(**currently amended**) The method of claim 7, wherein the tag is covalently bonded to the
2 modified nucleotide.

23.(currently amended) The method of claim 10, wherein the molecular tag comprises a fluorophore selected from the group consisting of 4-acetamido-4'-isothiocyanatostilbene-2,2'-disulfonic acid; acridine and derivatives: acridine, acridine isothiocyanate; 5- (2'-aminoethyl) aminonaphthalene-1-sulfonic acid (EDANS); 4-amino-3-vinylsulfonyl phenyl] naphthalimide-3,5 disulfonate; - (4-anilino-1-naphthyl) maleimide; anthranilamide; BODIPY; Brilliant Yellow; coumarin and derivatives: coumarin, 7-amino-4-methylcoumarin (AMC, Coumarin 120), 7-amino-4-trifluoromethylcoumarin (Coumarin 151); cyanine dyes; cyanosine; 4', 6-diaminidino-2-phenylindole (DAPI); 5', 5''-dibromopyrogallol-sulfonaphthalein (Bromopyrogallol Red); 7-diethylamino-3-(4'-isothiocyanatophenyl)-4-methylcoumarin; diethylenetriamine pentaacetate; 4,4'-diisothiocyanatodihydro-stilbene-2,2'-disulfonic acid; 4,4' diisothiocyanatostilbene-2,2'-disulfonic acid; 5-dimethylamino naphthalene-1-sulfonyl chloride (DNS, dansylchloride); 4-dimethylaminophenylazophenyl-4'-isothiocyanate (DABITC); eosin and derivatives: eosin, eosin isothiocyanate, erythrosin and derivatives: erythrosin B, erythrosin, isothiocyanate; ethidium; fluorescein and derivatives: 5-carboxyfluorescein (FAM), 5- (4, 6-dichlorotriazin-2-yl) aminofluorescein (DTAF), 2', 7'-dimethoxy-4',5'-dichloro-6-carboxyfluorescein (JOE), fluorescein, fluorescein isothiocyanate, QFITC, (XRITC); fluorescamine; IR144; IR1446; Malachite Green isothiocyanate; 4-methylumbelliferone-ortho cresolphthalein; nitrotyrosine; pararosaniline; Phenol Red; B-phycoerythrin; o-phthalaldehyde; pyrene and derivatives: pyrene, pyrene butyrate, succinimidyl 1-pyrene; butyrate quantum dots; Reactive Red 4 (Cibacron™ Brilliant Red 3B-A) rhodamine and derivatives: 6-carboxy-X-rhodamine (ROX), 6-carboxyrhodamine (R6G), lissamine rhodamine B sulfonyl chloride rhodamine (Rhod), rhodamine B, rhodamine 123, rhodamine X isothiocyanate, sulforhodamine B, sulforhodamine 101, sulfonyl chloride derivative of sulforhodamine 101 (Texas Red); N, N, N', N'-tetramethyl-6-carboxyrhodamine (TAMRA); tetramethyl rhodamine; tetramethyl rhodamine isothiocyanate (TRITC); riboflavin; rosolic acid; terbium chelate derivatives; Cy 3; Cy 5; Cy 5.5; Cy 7; IRD 700; IRD 800; La Jolla Blue; phthalocyanine; and naphthalocyanine.

24.(currently amended) The method of claim 10, wherein the molecular tag is selected from the group consisting of alkyl groups having between 1 and 30 carbon atoms, aryl groups having between about 6 and about 40 carbon atoms, or alkaryl and aralkyl groups having between about 7

4 and about 40 carbon atoms, or mixture or combinations thereof, where the carbon atoms are replace
5 by one or more hetero atoms in the structure provided the structure represents a stable molecular
6 system, where the hetero atoms selected from the group consisting of P, S, Si, N, and O.

1 **25.(currently amended)** The method of claim 10, wherein the molecular tag is selected from
2 the group consisting of 4-aminophenol, 6-aminonaphthol, 4-nitrophenol, 6-nitronaphthol, 4-
3 methylphenol, 6-chloronaphthol, 4-methoxyphenol, 6-bromonaphthol, 4-chlorophenol, 6-
4 iodonaphthol, 4-bromophenol, 4, 4'-dihydroxybiphenyl, 4-iodophenol, 8-hydroxyquinoline, 4-
5 nitronaphthol, 3-hydroxypyridine, 4-aminonaphthol, umbelliferone, 4-methylnaphthol, resorufin, 4-
6 methoxynaphthol, 8-hydroxypyrene, 4-chloronaphthol, 9-hydroxyanthracene, 4-bromonaphthol, 6-
7 nitro-9-hydroxyanthracene, 4-iodonaphthol, 3-hydroxyflavone, 6-methylnaphthol, fluorescein, 6-
8 methoxynaphthol, 3-hydroxybenzoflavone, 1-hydroxy-2-propyne, 1-hydroxy-4-pentyne, 1-hydroxy-
9 3-butyne, 1-hydroxy-5-hexyne, Methanol, Ethanol, Propanol, Isopropanol, Butanol, Tert-butanol,
10 Hexanol, Cyclohexanol, Heptanol, Octanol, Decanol, Undecanol, Dodecanol, 1-acetoxymethanol
11 (CH₃OCCH₂-O-NTP), 2-acetoxyethanol, 3-acetoxypopropanol, 4-acetoxybutanol, 5-acetoxypentanol,
12 6-acetoxyhexanol, 2-nitroethanol, 3-nitropropanol, 4-nitrobutanol, 5-nitropentanol, 5-nitrohexanol,
13 1-hydroxy-3-propene, 1-hydroxy-2-cyclohexene, 1-hydroxy-4-butene, 1-hydroxy-3-propaldehyde,
14 1-hydroxy-5-pentene, 1-hydroxy-4-butanaldehyde, 1-hydroxy-6-hexene, 1-hydroxy-3-Butanone,
15 Phenol, 4-methyl-3-hydroxypyridine, 4-Carboxyphenol, 5-methoxy-3-hydroxypyridine, 4-
16 Acetoxymethylphenol, 5-nitro-3-hydroxypyridine, 4-nitrophenol, 5-acetoxymethyl-3-
17 hydroxypyridine, 4-methylphenol, 6-methyl-8-hydroxyquinoline, 4-methoxyphenol 6-methoxy-8-
18 hydroxyquinoline, 4-ethylphenol, 4-methyl-8-hydroxyquinoline, 4-butylphenol, 6-nitro-8-
19 hydroxyquinoline, naphthol, 4-acetoxymethyl-8-hydroxyquinoline, 4 or 6 or 8 methylnaphthol
20 pyrene, 4 or 6 or 8 methoxynaphthol, 6-methyl-8-hydroxypyrene, 4 or 6 or 8 nitronaphthol, 6-ethyl-
21 8-hydroxypyrene, 4 or 6 or 8 ethylnaphthol, 6-nitro-8-hydroxypyrene, 4 or 6 or 8 butylnaphthol 6-
22 (carboxysuccinimidylester) fluorescein, 4 or 6 or 8 acetoxymethylnaphthol, 6-carboxymethyl-2, 7-
23 dichlorofluorescein, Methanol Cyclohexanol, 2-carboxy ethanol, 3-carboxypropanol, 4-
24 carboxybutanol, 2-hydroxyethanol, 3-hydroxypropanol, 4-hydroxybutanol, 2-aminoethanol, 2-
25 nitroethanol, 3-aminopropanol, 3-nitropropanol, 4-aminobutanol, and 4-nitrobutanol.

26.(previously presented) The method of claim 10, wherein the modified nucleotide is selected from the group consisting of Adenosine-5'- (γ -ANS) triphosphate, Guanosine-5'- (γ -ANS) triphosphate, Cytosine-5'- (γ -ANS) triphosphate, Thymidine-5'- (γ -ANS) triphosphate, Adenosine-5'- (γ -4-nitrophenyl) triphosphate, Adenosine-5'- (γ -4-iodonaphthyl), Guanosine-5'- (γ -4-nitrophenyl) triphosphate, triphosphate Adenosine-5'- (γ -6-methylnaphthyl) triphosphate, Cytosine-5'- (γ -4-nitrophenyl) triphosphate, Thymidine-5'- (γ -4-nitrophenyl) triphosphate, Adenosine-5'- (γ -6-methoxynaphthyl) triphosphate, Uracil-5'- (γ -4-nitrophenyl) triphosphate, 3'-azido-3'-deoxythymidine-5'-(γ -4-nitrophenyl)triphosphate, Adenosine-5'- (γ -6-aminonaphthyl) triphosphate, 3'-azido-2', 3'-dideoxythymidine-5'- (γ -4- nitrophenyl)triphosphate, Adenosine-5'- (γ -6-nitronaphthyl) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'- (γ -4-nitrophenyl)triphosphate, Adenosine-5'- (γ -6-chloronaphthyl) triphosphate, Adenosine-5'- (γ -4-aminophenyl) triphosphate, Adenosine-5'- (γ -6-bromonaphthyl) triphosphate, Adenosine-5'- (γ -4-methylphenyl) triphosphate, Adenosine-5'- (γ -6-iodonaphthyl) triphosphate, Adenosine-5'- (γ -4-methoxyphenyl) triphosphate, Adenosine-5'-(γ -4'-hydroxybiphenyl) triphosphate, Adenosine-5'- (γ -4-chlorophenyl) triphosphate, Adenosine-5'- (γ -8-quinolyl) triphosphate, Adenosine-5'- (γ -4-bromophenyl) triphosphate, Adenosine-5'- (γ -3-pyridyl) triphosphate, Adenosine-5'- (γ -umbelliferone), Adenosine-5'- (γ -4-iodophenyl) triphosphate, Adenosine-5'- (γ -4-nitronaphthyl) triphosphate, Adenosine-5'- (γ -resorufin) triphosphate, Adenosine-5'- (γ -pyrene) triphosphate, Adenosine-5'- (γ -4-aminonaphthyl) triphosphate, Adenosine-5'- (γ -anthracene) triphosphate, Adenosine-5'-(γ -6-nitroanthracene) triphosphate, Adenosine-5'- (γ -4-methylnaphthyl) triphosphate, Adenosine-5'- (γ -flavonyl) triphosphate, Adenosine-5'-(γ -4-methoxynaphthyl) triphosphate, Adenosine-5'-(γ -fluorescein) triphosphate, Adenosine-5'- (γ -benzoflavone) triphosphate, Adenosine-5'- (γ -4-chloronaphthyl) triphosphate, Adenosine-5'- (γ - (4-nitrophenyl)- γ' - (4-aminophenyl) triphosphate, Adenosine-5'- (γ -4-bromonaphthyl) triphosphate, Adenosine-5'- (γ - (4-nitrophenyl)- γ' - (4-nitronaphthyl) triphosphate, Adenosine-5'- (γ -methyl) triphosphate, Adenosine-5'- (γ -acetoxypentyl)triphosphate, Guanosine-5'- (γ -methyl) triphosphate, Cytosine-5'- (γ -methyl) triphosphate, Adenosine-5'- (γ -acetoxymethyl)triphosphate (CH₃OCCH₂-O-NTP), Thymidine-5'- (γ -methyl) triphosphate, Uracil-5'- (γ -methyl) triphosphate, Adenosine-5'-(γ -acetoxylethyl) triphosphate, 3'-azido-3'-deoxythymidine-5'-(γ -methyl)triphosphate, Adenosine-5'- (γ -acetoxypentyl)triphosphate, 3'-azido-2', 3'-dideoxythymidine-5'- (γ -methyl) triphosphate, Adenosine-5'- (γ , acetoxypentyl) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'- (γ -methyl)

32 triphosphate, Adenosine-5'- (γ- acetoxyhexyl) triphosphate, Adenosine-5'- (γ-ethyl) triphosphate,
33 Adenosine-5'- (γ-2-nitroethyl) triphosphate, Adenosine-5'- (γ-propyl) triphosphate, Adenosine-5'-
34 (γ-4-butyl) triphosphate, Adenosine-5'- (γ-3-nitropropyl) triphosphate, Adenosine-5'- (γ-hexyl)
35 triphosphate, Adenosine-5'- (γ-octyl) triphosphate, Adenosine-5'- (γ-4-nitrobutyl)triphosphate,
36 Adenosine-5'- (γ-decyl) triphosphate, Adenosine-5'- (γ-dodecyl) triphosphate, Adenosine-5'- (γ-5-
37 nitropentyl)triphosphate, Adenosine-5'- (γ-isopropyl) triphosphate, Adenosine-5'- (γ-tert-butyl)
38 triphosphate, Adenosine-5'- (γ-methyl)- (γ'-ethyl) triphosphate, Adenosine-5'- (γ-cyclohexyl)
39 triphosphate, Adenosine-5'- (γ-methyl)- (γ'-propyl) triphosphate, Adenosine-5'- (γ-2-propenyl)
40 triphosphate, Adenosine-5'- (γ-3-butenyl) triphosphate, Guanosine-5'- (γ-2-propenyl) triphosphate,
41 Adenosine-5'- (γ-4-pentenyl) triphosphate, Cytosine-5'- (γ-2-propenyl) triphosphate, Adenosine-5'-
42 (γ-5-hexenyl) triphosphate, Thymidine-5'- (γ-2-propenyl) triphosphate, Adenosine-5'- (γ-
43 cyclohexenyl) triphosphate, Uracil-5'- (γ-2-propenyl) triphosphate, Adenosine-5'- (γ-3-
44 propanaldehyde) triphosphate, 3'-azido-3'-deoxythymidine-5'- (γ-2-propenyl) triphosphate,
45 Adenosine-5'-(γ-4-butanaldehyde) triphosphate, 3'-azido-2',3'-dideoxythymidine-5'- (γ-2- propenyl)
46 triphosphate, Adenosine-5'- (γ-3-butanone) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'-
47 (γ-2-propenyl) triphosphate, Adenosine-5'- (γ-2-propynyl) triphosphate, 3'-azido-2', 3'-
48 dideoxythymidine-5'- (γ-2-propynyl) triphosphate, Guanosine-5'- (γ-2-propynyl) triphosphate,
49 Cytosine-5'- (γ-2-propynyl) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'- (γ-2-propynyl)
50 triphosphate Thymidine 5'- (γ-2-propynyl) triphosphate, Uracil-5'- (γ-2-propynyl) triphosphate,
51 Adenosine-5'- (γ-3-butynyl) triphosphate, 3'-azido-3'-deoxythymidine-5'- (γ-2-propynyl)
52 triphosphate, Adenosine-5'- (γ-4-pentynyl) triphosphate, Adenosine-5'- (γ-5-pentynyl) triphosphate,
53 Adenosine-5'- (γ-4-phenyl) triphosphate, Adenosine-5'- (γ- (4 or 6 or 8 acetoxymethyl naphthyl)
54 triphosphate, Guanosine-5'- (γ-4-phenyl) triphosphate, Cytosine-5'- (γ-4-phenyl) triphosphate,
55 Adenosine-5'- (γ- (4-methylpyridyl)triphosphate, Thymidine-5'- (γ-4-phenyl) triphosphate, Uracil-5'-
56 (γ-4-phenyl) triphosphate, Adenosine-5'- (γ- (5-methoxypyridyl)triphosphate, 3'-azido-3'-
57 deoxythymidine-5'- (γ-4-phenyl) triphosphate, Adenosine-5'- (γ- (5-nitropyridyl)triphosphate, 3'-
58 azido-2',3'-dideoxythymidine-5'- (γ-4-phenyl) triphosphate, Adenosine-5'- (γ- (5-
59 acetoxymethylpyridyl) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'- (γ-4-phenyl)
60 triphosphate, Adenosine-5'- (γ- (6-methyl-1-quinolyl) triphosphate, Adenosine-5'- (γ-4-
61 carboxyphenyl) triphosphate, Adenosine-5'-(γ-(6-methoxy-1-quinolyl)triphosphate, Adenosine-5'-
62 (γ- (4-acetoxymethyl) phenyl) triphosphate, Adenosine-5'- (γ- (4-methyl-1-quinolyl)triphosphate,

Adenosine-5'- (γ-4-nitrophenyl) triphosphate, Adenosine-5'- (γ-4-methylphenyl)triphosphate, Adenosine-5'- (γ- (6-nitro-1-quinolyl) triphosphate, Adenosine-5'- (γ-4-methoxyphenyl) triphosphate, Adenosine-5'- (γ- (4-acetoxymethylpyrenyl) triphosphate, Adenosine-5'- (γ-4-ethylphenyl) triphosphate, Adenosine-5'- (γ- (6-methylpyrenyl) triphosphate, Adenosine-5'- (γ-4-butylphenyl) triphosphate, Adenosine 5'-(γ-naphthyl) triphosphate, Adenosine-5'- (γ- (6-ethylpyrenyl) triphosphate, Adenosine-5'- (γ- (4 or 6 or 8 methyl naphthyl)triphosphate, Adenosine-5'- (γ- (6-nitropyrenyl) triphosphate, Adenosine-5'- (γ- (4 or 6 or 8 methoxynaphthyl) triphosphate, Adenosine-5'- (γ-6- (carboxysuccinimidyl fluorescein) triphosphate, Adenosine-5'- (γ- (4 or 6 or 8 nitro naphthyl) triphosphate. Adenosine-5'- (γ-6-carboxymethyl-2, 7-dichlorofluorescein) triphosphate, Adenosine-5'- (γ- (4 or 6 or 8 ethyl naphthyl) triphosphate, Adenosine-5'- (γ-4-phenyl)- (γ'-4 nitrophenyl) triphosphate, Adenosine-5'- (γ- (4 or 6 or 8 butyl naphthyl)triphosphate, Adenosine-5'- (γ-4-phenyl)- (γ'-4 aminophenyl)triphosphate, Adenosine-5'- (γ-methyl) triphosphate, Adenosine-5'- (γ-3-aminopropyl) triphosphate, Guanosine-5'- (γ-methyl) triphosphate, Adenosine-5'- (γ-4-aminobutyl) triphosphate, Cytosine-5'- (γ-methyl) triphosphate Adenosine-5'- (γ-cyclohexyl) triphosphate, Thymidine-5'- (γ-methyl) triphosphate Adenosine-5'- (γ-2-carboxyethyl) triphosphate, Uracil-5'- (γ-methyl) triphosphate, Adenosine-5'- (γ-3-carboxypropyl)triphosphate, 3'-azido-3'-deoxythymidine-5'- (7-methyl) triphosphate, Adenosine-5'- (γ-4-carboxybutyl) triphosphate, 3'-azido-2',3'-dideoxythymidine-5'- (γ-methyl) triphosphate, Adenosine-5'- (γ-2-hydroxyethyl) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'-(γ-methyl)triphosphate, Adenosine-5'- (γ-3-hydroxypropyl) triphosphate, Adenosine-5'- (γ-ethyl) triphosphate, Adenosine-5'- (γ-propyl) triphosphate, Adenosine-5'- (γ-4-hydroxybutyl) triphosphate, Adenosine-5'- (γ-4-butyl) triphosphate, Adenosine-5'- (γ-2-nitroethyl) triphosphate, Adenosine-5'- (γ-hexyl) triphosphate, Adenosine-5'- (γ-3-nitropropyl) triphosphate, Adenosine-5'- (γ-isopropyl) triphosphate, Adenosine-5'- (γ-4-nitrobutyl) triphosphate, Adenosine-5'- (γ-tert-butyl) triphosphate ,Adenosine-5'- (γ-methyl)- (γ'-ethyl)triphosphate, Adenosine-5'- (γ-cyclohexyl) triphosphate, Adenosine-5'- (γ-2-aminoethyl)triphosphate, and Adenosine-5'- (γ-methyl)- (γ'-propyl) triphosphate.

27.(currently amended) The method of claim 13, wherein the tag is covalently bonded to the modified nucleotide through a linker.

1 28.(currently amended) The method of claim 13, wherein the tag is covalently bonded to the
2 modified nucleotide.

1 29.(previously presented) The method of claim 13, wherein the modified nucleotide comprises
2 a β and/or γ phosphate modified nucleotide.

1 30.(previously presented) The method of claim 13, wherein the modified nucleotide comprises
2 a β phosphate modified nucleotide.

1 31.(previously presented) The method of claim 13, wherein the modified nucleotide comprises
2 a γ phosphate modified nucleotide.

32.(canceled)

1 33.(canceled)

2 34.(canceled)

1 35.(previously presented) The method of claim 31, wherein the modified nucleotide is selected
2 from the group consisting of Adenosine-5'- (γ -ANS) triphosphate, Guanosine-5'- (γ -ANS)
3 triphosphate, Cytosine-5'- (γ -ANS) triphosphate, Thymidine-5'- (γ -ANS) triphosphate, Adenosine-
4 5'- (γ -4-nitrophenyl) triphosphate, Adenosine-5'- (γ -4-iodonaphthyl), Guanosine-5'- (γ -4-
5 nitrophenyl) triphosphate, triphosphate Adenosine-5'- (γ -6-methylnaphthyl) triphosphate, Cytosine-
6 5'- (γ -4-nitrophenyl) triphosphate, Thymidine-5'- (γ -4-nitrophenyl) triphosphate, Adenosine-5'- (γ -6-
7 methoxynaphthyl) triphosphate, Uracil-5'- (γ -4-nitrophenyl) triphosphate, 3'-azido-3'-
8 deoxythymidine-5'- (γ -4-nitrophenyl) triphosphate, Adenosine-5'- (γ -6-aminonaphthyl) triphosphate,
9 3'-azido-2', 3'-dideoxythymidine-5'- (γ -4- nitrophenyl) triphosphate, Adenosine-5'- (γ -6-
10 nitronaphthyl) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'- (γ -4-
11 nitrophenyl) triphosphate, Adenosine-5'- (γ -6-chloronaphthyl) triphosphate, Adenosine-5'- (γ -4-
12 aminophenyl) triphosphate, Adenosine-5'- (γ -6-bromonaphthyl) triphosphate, Adenosine-5'- (γ -4-
13 methylphenyl) triphosphate, Adenosine-5'- (γ -6-iodonaphthyl) triphosphate, Adenosine-5'- (γ -4-
14 methoxyphenyl) triphosphate, Adenosine-5'- (γ -4'-hydroxybiphenyl) triphosphate, Adenosine-5'- (γ -
15 4-chlorophenyl) triphosphate, Adenosine-5'- (γ -8-quinolyl) triphosphate, Adenosine-5'- (γ -4-

bromophenyl) triphosphate, Adenosine-5'- (γ-3-pyridyl) triphosphate, Adenosine-5'- (γ-umbelliferone), Adenosine-5'- (γ-4-iodophenyl) triphosphate, Adenosine-5'- (γ-4-nitronaphthyl) triphosphate, Adenosine-5'- (γ-resorufin) triphosphate, Adenosine-5'- (γ-pyrene) triphosphate, Adenosine-5'- (γ-4-aminonaphthyl) triphosphate, Adenosine-5'- (γ-anthracene) triphosphate, Adenosine-5'-(Γ-6-nitroanthracene) triphosphate, Adenosine-5'- (γ-4-methylnaphthyl) triphosphate, Adenosine-5'- (γ-flavonyl) triphosphate, Adenosine-5'-(γ-4-methoxynaphthyl) triphosphate, Adenosine-5'-(γ-fluorescein) triphosphate, Adenosine-5'- (γ-benzoflavone) triphosphate, Adenosine-5'- (γ-4-chloronaphthyl) triphosphate, Adenosine-5'- (γ- (4-nitrophenyl)- γ'- (4-aminophenyl) triphosphate, Adenosine-5'- (γ-4-bromonaphthyl) triphosphate, Adenosine-5'- (γ- (4-nitrophenyl)- γ'- (4-nitronaphthyl) triphosphate, Adenosine-5'- (γ-methyl) triphosphate, Adenosine-5'- (γ-acetoxypropyl) triphosphate, Guanosine-5'- (γ-methyl) triphosphate, Cytosine-5'- (γ-methyl) triphosphate, Adenosine-5'- (γ-acetoxymethyl) triphosphate (CH₃OCCH₂-O-NTP), Thymidine-5'- (γ-methyl) triphosphate, Uracil-5'- (γ-methyl) triphosphate, Adenosine-5'-(γ-acetoxyethyl) triphosphate, 3'-azido-3'-deoxythymidine-5'-(γ-methyl) triphosphate, Adenosine-5'- (γ-acetoxybutyl) triphosphate, 3'-azido-2', 3'-dideoxythymidine-5'- (γ-methyl) triphosphate, Adenosine-5'- (γ, acetoxypentyl) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'- (γ-methyl) triphosphate, Adenosine-5'- (γ- acetoxyhexyl) triphosphate, Adenosine-5'- (γ-ethyl) triphosphate, Adenosine-5'- (γ-2-nitroethyl) triphosphate, Adenosine-5'- (γ-propyl) triphosphate, Adenosine-5'- (γ-4-butyl) triphosphate, Adenosine-5'- (γ-3-nitropropyl) triphosphate, Adenosine-5'- (γ-hexyl) triphosphate, Adenosine-5'- (γ-octyl) triphosphate, Adenosine-5'- (γ-4-nitrobutyl) triphosphate, Adenosine-5'- (γ-decyl) triphosphate, Adenosine-5'- (γ-dodecyl) triphosphate, Adenosine-5'- (γ-5-nitropentyl) triphosphate, Adenosine-5'- (γ-isopropyl) triphosphate, Adenosine-5'- (γ-tert-butyl) triphosphate, Adenosine-5'- (γ-methyl)- (γ'-ethyl) triphosphate, Adenosine-5'- (γ-cyclohexyl) triphosphate, Adenosine-5'- (γ-methyl)- (γ'-propyl) triphosphate, Adenosine-5'- (γ-2-propenyl) triphosphate, Adenosine-5'- (γ-3-butenyl) triphosphate, Guanosine-5'- (γ-2-propenyl) triphosphate, Adenosine-5'- (γ-4-pentenyl) triphosphate, Cytosine-5'- (γ-2-propenyl) triphosphate, Adenosine-5'- (γ-5-hexenyl) triphosphate, Thymidine-5'- (γ-2-propenyl) triphosphate, Adenosine-5'- (γ-cyclohexenyl) triphosphate, Uracil-5'- (γ-2-propenyl) triphosphate, Adenosine-5'- (γ-3-propanaldehyde) triphosphate, 3'-azido-3'-deoxythymidine-5'- (γ-2-propenyl) triphosphate, Adenosine-5'-(γ-4-butanaldehyde) triphosphate, 3'-azido-2', 3'-dideoxythymidine-5'- (γ-2-propenyl) triphosphate, Adenosine-5'- (γ-3-butanone) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'-

(γ -2-propenyl) triphosphate, Adenosine-5'- (γ -2-propynyl) triphosphate, 3'-azido-2', 3'-
dideoxythymidine-5'- (γ -2-propynyl) triphosphate, Guanosine-5'- (γ -2-propynyl) triphosphate,
Cytosine-5'- (γ -2-propynyl) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'- (γ -2-propynyl)
triphosphate Thymidine 5'- (γ -2-propynyl) triphosphate, Uracil-5'- (γ -2-propynyl) triphosphate,
Adenosine-5'- (γ -3-butynyl) triphosphate, 3'-azido-3'-deoxythymidine-5'- (γ -2-propynyl)
triphosphate, Adenosine-5'- (γ -4-pentynyl) triphosphate, Adenosine-5'- (γ -5-pentynyl) triphosphate,
Adenosine-5'- (γ -4-phenyl) triphosphate, Adenosine-5'- (γ - (4 or 6 or 8 acetoxymethyl naphthyl)
triphosphate, Guanosine-5'- (γ -4-phenyl) triphosphate, Cytosine-5'- (γ -4-phenyl) triphosphate,
Adenosine-5'- (γ - (4-methylpyridyl)triphosphate, Thymidine-5'- (γ -4-phenyl) triphosphate, Uracil-5'-
(γ -4-phenyl) triphosphate, Adenosine-5'- (γ - (5-methoxypyridyl)triphosphate, 3'-azido-3'-
deoxythymidine-5'- (γ -4-phenyl) triphosphate, Adenosine-5'- (γ - (5-nitropyridyl)triphosphate, 3'-
azido-2',3'-dideoxythymidine-5'- (γ -4-phenyl) triphosphate, Adenosine-5'- (γ - (5-
acetoxymethylpyridyl) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'- (γ -4-phenyl)
triphosphate, Adenosine-5'- (γ - (6-methyl-1-quinolyl) triphosphate, Adenosine-5'- (γ -4-
carboxyphenyl) triphosphate, Adenosine-5'-(γ -(6-methoxy-1-quinolyl)triphosphate, Adenosine-5'-
(γ - (4-acetoxymethyl) phenyl) triphosphate, Adenosine-5'- (γ - (4-methyl-1-quinolyl)triphosphate,
Adenosine-5'- (γ -4-nitrophenyl) triphosphate, Adenosine-5'- (γ -4-methylphenyl)triphosphate,
Adenosine-5'- (γ - (6-nitro-1-quinolyl) triphosphate, Adenosine-5'- (γ -4-methoxyphenyl)
triphosphate, Adenosine-5'- (γ - (4-acetoxymethylpyrenyl) triphosphate, Adenosine-5'- (γ -4-
ethylphenyl) triphosphate, Adenosine-5'- (γ - (6-methylpyrenyl) triphosphate, Adenosine-5'- (γ -4-
butylphenyl) triphosphate, Adenosine 5'-(γ -naphthyl) triphosphate, Adenosine-5'- (γ - (6-
ethylpyrenyl) triphosphate, Adenosine-5'- (γ - (4 or 6 or 8 methyl naphthyl)triphosphate, Adenosine-
5'- (γ - (6-nitropyrenyl) triphosphate, Adenosine-5'- (γ - (4 or 6 or 8 methoxynaphthyl) triphosphate,
Adenosine-5'- (γ -6- (carboxysuccinimidyl fluorescein) triphosphate, Adenosine-5'- (γ - (4 or 6 or 8
nitro naphthyl) triphosphate. Adenosine-5'- (γ -6-carboxymethyl-2, 7-dichlorofluorescein)
triphosphate, Adenosine-5'- (γ - (4 or 6 or 8 ethyl naphthyl) triphosphate, Adenosine-5'- (γ -4-phenyl)-
(γ '-4 nitrophenyl) triphosphate, Adenosine-5'- (γ - (4 or 6 or 8 butyl naphthyl)triphosphate,
Adenosine-5'- (γ -4-phenyl)- (γ '-4 aminophenyl)triphosphate, Adenosine-5'- (γ -methyl) triphosphate,
Adenosine-5'- (γ -3-aminopropyl) triphosphate, Guanosine-5'- (γ -methyl) triphosphate, Adenosine-5'-
(γ -4-aminobutyl) triphosphate, Cytosine-5'- (γ -methyl) triphosphate Adenosine-5'- (γ -cyclohexyl)
triphosphate, Thymidine-5'- (γ -methyl) triphosphate Adenosine-5'- (γ -2-carboxyethyl) triphosphate,

78 Uracil-5'- (γ-methyl) triphosphate, Adenosine-5'- (γ-3-carboxypropyl)triphosphate, 3'-azido-3'-
79 deoxythymidine-5'- (7-methyl) triphosphate, Adenosine-5'- (γ-4-carboxybutyl) triphosphate, 3'-
80 azido-2',3'-dideoxythymidine-5'- (γ-methyl) triphosphate, Adenosine-5'- (γ-2-hydroxyethyl)
81 triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'-(γ-methyl)triphosphate, Adenosine-5'- (γ-3-
82 hydroxypropyl) triphosphate, Adenosine-5'- (γ-ethyl) triphosphate, Adenosine-5'- (γ-propyl)
83 triphosphate, Adenosine-5'- (γ-4-hydroxybutyl) triphosphate, Adenosine-5'- (γ-4-butyl) triphosphate,
84 Adenosine-5'- (γ-2-nitroethyl) triphosphate, Adenosine-5'- (γ-hexyl) triphosphate, Adenosine-5'- (γ-
85 3-nitropropyl) triphosphate, Adenosine-5'- (γ-isopropyl) triphosphate, Adenosine-5'- (γ-4-nitrobutyl)
86 triphosphate, Adenosine-5'- (γ-tert-butyl) triphosphate ,Adenosine-5'- (γ-methyl)- (γ'-
87 ethyl)triphosphate, Adenosine-5'- (γ-cyclohexyl) triphosphate, Adenosine-5'- (γ-2-
88 aminoethyl)triphosphate, and Adenosine-5'- (γ-methyl)- (γ'-propyl) triphosphate.

1 36.(previously presented) The method of claim 7, wherein the polymerizing agent is selected
2 from the group consisting of naturally occurring or synthetic polymerases and reverse transcriptases.

1 37.(previously presented) The method of claim 13, wherein the polymerizing agent is selected
2 from the group consisting of naturally occurring or synthetic polymerases and reverse transcriptases.

1 38.(currently amended) The kit of claim 15, wherein the tag is covalently bonded to the
2 modified nucleotide through a linker.

1 39.(currently amended) The kit of claim 15, wherein the tag is covalently bonded to the
2 modified nucleotide.

1 40.(previously presented) The kit of claim 15, wherein the modified nucleotide comprises a β
2 and/or γ phosphate modified nucleotide.

1 41.(previously presented) The kit of claim 15, wherein the modified nucleotide comprises a β
2 phosphate modified nucleotide.

1 42.(previously presented) The kit of claim 15, wherein the modified nucleotide comprises a γ
2 phosphate modified nucleotide.

1 43.(previously presented) The kit of claim 39, wherein the molecular tag comprises a
2 fluorophore selected from the group consisting of 4-acetamido-4'-isothiocyanatostilbene-
3 2,2'-disulfonic acid; acridine and derivatives: acridine, acridine isothiocyanate; 5- (2'-aminoethyl)
4 aminonaphthalene-1-sulfonic acid (EDANS); 4-amino-3-vinylsulfonyl phenyl] naphthalimide-3,5
5 disulfonate; - (4-anilino-1-naphthyl) maleimide; anthranilamide; BODIPY; Brilliant Yellow;
6 coumarin and derivatives: coumarin, 7-amino-4-methylcoumarin (AMC, Coumarin 120), 7-amino-
7 4-trifluoromethylcoumarin (Coumarin 151); cyanine dyes; cyanosine; 4', 6-diaminidino-
8 2-phenylindole (DAPI); 5', 5''-dibromopyrogallol-sulfonaphthalein (Bromopyrogallol Red); 7-
9 diethylamino-3- (4'-isothiocyanatophenyl)-4-methylcoumarin; diethylenetriamine pentaacetate; 4,4'-
10 diisothiocyanatodihydro-stilbene-2,2'-disulfonic acid; 4,4' diisothiocyanatostilbene-2,2'-disulfonic
11 acid; 5-dimethylamino naphthalene-1-sulfonyl chloride (DNS, dansylchloride); 4-
12 dimethylaminophenylazophenyl-4'-isothiocyanate (DABITC); eosin and derivatives: eosin, eosin
13 isothiocyanate, erythrosin and derivatives: erythrosin B, erythrosin, isothiocyanate; ethidium;
14 fluorescein and derivatives: 5-carboxyfluorescein (FAM), 5- (4, 6-dichlorotriazin-2-yl)
15 aminofluorescein (DTAF), 2', 7'-dimethoxy-4',5'-dichloro-6-carboxyfluorescein (JOE), fluorescein,
16 fluorescein isothiocyanate, QFITC, (XRITC); fluorescamine; IR144; IR1446; Malachite Green
17 isothiocyanate; 4-methylumbelliferoneortho cresolphthalein; nitrotyrosine; pararosaniline; Phenol
18 Red; B-phycoerythrin; o-phthalaldehyde; pyrene and derivatives: pyrene, pyrene butyrate,
19 succinimidyl 1-pyrene; butyrate quantum dots; Reactive Red 4 (Cibacron™ Brilliant Red 3B-A)
20 rhodamine and derivatives: 6-carboxy-X-rhodamine (ROX), 6-carboxyrhodamine (R6G), lissamine
21 rhodamine B sulfonyl chloride rhodamine (Rhod), rhodamine B, rhodamine 123, rhodamine X
22 isothiocyanate, sulforhodamine B, sulforhodamine 101, sulfonyl chloride derivative of
23 sulforhodamine 101 (Texas Red); N, N, N', N'-tetramethyl-6-carboxyrhodamine (TAMRA);
24 tetramethyl rhodamine; tetramethyl rhodamine isothiocyanate (TRITC); riboflavin; rosolic acid;
25 terbium chelate derivatives; Cy 3; Cy 5; Cy 5.5; Cy 7; IRD 700; IRD 800; La Jolla Blue; phthalocyanine;
26 and naphthalocyanine.

1 44.(previously presented) The kit of claim 39, wherein the molecular tag is selected from the
2 group consisting of alkyl groups having between 1 and 30 carbon atoms, aryl groups having between
3 about 6 and about 40 carbon atoms, or alkaryl and aralkyl groups having between about 7 and about
4 40 carbon atoms, or mixture or combinations thereof, where the carbon atoms are replaced by one or
5 more hetero atoms in the structure provided the structure represents a stable molecular system, where
6 the hetero atoms selected from the group consisting of P, S, Si, N, and O.

1 45.(previously presented) The kit of claim 39, wherein the molecular tag is selected from the
2 group consisting of 4-aminophenol, 6-aminonaphthol, 4-nitrophenol, 6-nitronaphthol, 4-
3 methylphenol, 6-chloronaphthol, 4-methoxyphenol, 6-bromonaphthol, 4-chlorophenol, 6-
4 iodonaphthol, 4-bromophenol, 4, 4'-dihydroxybiphenyl, 4-iodophenol, 8-hydroxyquinoline, 4-
5 nitronaphthol, 3-hydroxypyridine, 4-aminonaphthol, umbelliferone, 4-methylnaphthol, resorufin, 4-
6 methoxynaphthol, 8-hydroxypyrene, 4-chloronaphthol, 9-hydroxyanthracene, 4-bromonaphthol, 6-
7 nitro-9-hydroxyanthracene, 4-iodonaphthol, 3-hydroxyflavone, 6-methylnaphthol, fluorescein, 6-
8 methoxynaphthol, 3-hydroxybenzoflavone, 1-hydroxy-2-propyne, 1-hydroxy-4-pentyne, 1-hydroxy-
9 3-butyne, 1-hydroxy-5-hexyne, Methanol, Ethanol, Propanol, Isopropanol, Butanol, Tert-butanol,
10 Hexanol, Cyclohexanol, Heptanol, Octanol, Decanol, Undecanol, Dodecanol, 1-acetoxymethanol
11 (CH₃OCCH₂-O-NTP), 2-acetoxyethanol, 3-acetoxypentanol, 4-acetoxybutanol, 5-acetoxypentanol,
12 6-acetoxyhexanol, 2-nitroethanol, 3-nitropropanol, 4-nitrobutanol, 5-nitropentanol, 5-nitrohexanol,
13 1-hydroxy-3-propene, 1-hydroxy-2-cyclohexene, 1-hydroxy-4-butene, 1-hydroxy-3-propaldehyde,
14 1-hydroxy-5-pentene, 1-hydroxy-4-butanaldehyde, 1-hydroxy-6-hexene, 1-hydroxy-3-Butanone,
15 Phenol, 4-methyl-3-hydroxypyridine, 4-Carboxyphenol, 5-methoxy-3-hydroxypyridine, 4-
16 Acetoxymethylphenol, 5-nitro-3-hydroxypyridine, 4-nitrophenol, 5-acetoxymethyl-3-
17 hydroxypyridine, 4-methylphenol, 6-methyl-8-hydroxyquinoline, 4-methoxyphenol 6-methoxy-8-
18 hydroxyquinoline, 4-ethylphenol, 4-methyl-8-hydroxyquinoline, 4-butylphenol, 6-nitro-8-
19 hydroxyquinoline, naphthol, 4-acetoxymethyl-8-hydroxyquinoline, 4 or 6 or 8 methylnaphthol
20 pyrene, 4 or 6 or 8 methoxynaphthol, 6-methyl-8-hydroxypyrene, 4 or 6 or 8 nitronaphthol, 6-ethyl-
21 8-hydroxypyrene, 4 or 6 or 8 ethylnaphthol, 6-nitro-8-hydroxypyrene, 4 or 6 or 8 butylnaphthol 6-
22 (carboxysuccinimidylester) fluorescein, 4 or 6 or 8 acetoxymethylnaphthol, 6-carboxymethyl-2, 7-
23 dichlorofluorescein, Methanol Cyclohexanol, 2-carboxy ethanol, 3-carboxypropanol, 4-

24 carboxybutanol, 2-hydroxyethanol, 3-hydroxypropanol, 4-hydroxybutanol, 2-aminoethanol, 2-
25 nitroethanol, 3-aminopropanol, 3-nitropropanol, 4-aminobutanol, and 4-nitrobutanol.

1 46.(previously presented) The kit of claim 42, wherein the modified nucleotide is selected from
2 the group consisting of Adenosine-5'- (γ-ANS) triphosphate, Guanosine-5'- (γ-ANS) triphosphate,
3 Cytosine-5'- (γ-ANS) triphosphate, Thymidine-5'- (γ-ANS) triphosphate, Adenosine-5'- (γ-4-
4 nitrophenyl) triphosphate, Adenosine-5'- (γ-4-iodonaphthyl), Guanosine-5'- (γ-4-nitrophenyl)
5 triphosphate, triphosphate Adenosine-5'- (γ-6-methylnaphthyl) triphosphate, Cytosine-5'- (γ-4-
6 nitrophenyl) triphosphate, Thymidine-5'- (γ-4-nitrophenyl) triphosphate, Adenosine-5'- (γ-6-
7 methoxynaphthyl) triphosphate, Uracil-5'- (γ-4-nitrophenyl) triphosphate, 3'-azido-3'-
8 deoxythymidine-5'-(γ-4-nitrophenyl)triphosphate, Adenosine-5'- (γ-6-aminonaphthyl) triphosphate,
9 3'-azido-2', 3'-dideoxythymidine-5'- (γ-4- nitrophenyl)triphosphate, Adenosine-5'- (γ-6-
10 nitronaphthyl) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'- (γ-4-
11 nitrophenyl)triphosphate, Adenosine-5'- (γ-6-chloronaphthyl) triphosphate, Adenosine-5'- (γ-4-
12 aminophenyl) triphosphate, Adenosine-5'- (γ-6-bromonaphthyl) triphosphate, Adenosine-5'- (γ-4-
13 methylphenyl) triphosphate, Adenosine-5'- (γ-6-iodonaphthyl) triphosphate, Adenosine-5'- (γ-4-
14 methoxyphenyl) triphosphate, Adenosine-5'-(γ-4'-hydroxybiphenyl) triphosphate, Adenosine-5'- (γ-
15 4-chlorophenyl) triphosphate, Adenosine-5'- (γ-8-quinolyl) triphosphate, Adenosine-5'- (γ-4-
16 bromophenyl) triphosphate, Adenosine-5'- (γ-3-pyridyl) triphosphate, Adenosine-5'- (γ-
17 umbelliferone), Adenosine-5'- (γ-4-iodophenyl) triphosphate, Adenosine-5'- (γ-4-nitronaphthyl)
18 triphosphate, Adenosine-5'- (γ-resorufin) triphosphate, Adenosine-5'- (γ-pyrene) triphosphate,
19 Adenosine-5'- (γ-4-aminonaphthyl) triphosphate, Adenosine-5'- (γ-anthracene) triphosphate,
20 Adenosine-5'-(Γ-6-nitroanthracene) triphosphate, Adenosine-5'- (γ-4-methylnaphthyl) triphosphate,
21 Adenosine-5'- (γ-flavonyl) triphosphate, Adenosine-5'-(γ-4-methoxynaphthyl) triphosphate,
22 Adenosine-5'-(γ-fluorescein) triphosphate, Adenosine-5'- (γ-benzoflavone) triphosphate, Adenosine-
23 5'- (γ-4-chloronaphthyl) triphosphate, Adenosine-5'- (γ- (4-nitrophenyl)- γ'- (4-aminophenyl)
24 triphosphate, Adenosine-5'- (γ-4-bromonaphthyl) triphosphate, Adenosine-5'- (γ- (4-nitrophenyl)-
25 γ'- (4-nitronaphthyl) triphosphate, Adenosine-5'- (γ-methyl) triphosphate, Adenosine-5'- (γ-
26 acetoxypentyl)triphosphate, Guanosine-5'- (γ-methyl) triphosphate, Cytosine-5'- (γ-methyl)
27 triphosphate, Adenosine-5'- (γ-acetoxymethyl)triphosphate (CH₃OCCH₂-O-NTP), Thymidine-5'-
28 (γ-methyl) triphosphate, Uracil-5'- (γ-methyl) triphosphate, Adenosine-5'-(γ-acetoxyethyl)

29 triphosphate, 3'-azido-3'-deoxythymidine-5'-(γ -methyl)triphosphate, Adenosine-5'- (γ -
30 acetoxybutyl)triphosphate, 3'-azido-2', 3'-dideoxythymidine-5'- (γ -methyl) triphosphate, Adenosine-
31 5'- (γ , acetoxypropyl) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'- (γ -methyl)
32 triphosphate, Adenosine-5'- (γ - acetoxyhexyl) triphosphate, Adenosine-5'- (γ -ethyl) triphosphate,
33 Adenosine-5'- (γ -2-nitroethyl) triphosphate, Adenosine-5'- (γ -propyl) triphosphate, Adenosine-5'-
34 (γ -4-butyl) triphosphate, Adenosine-5'- (γ -3-nitropropyl) triphosphate, Adenosine-5'- (γ -hexyl)
35 triphosphate, Adenosine-5'- (γ -octyl) triphosphate, Adenosine-5'- (γ -4-nitrobutyl)triphosphate,
36 Adenosine-5'- (γ -decyl) triphosphate, Adenosine-5'- (γ -dodecyl) triphosphate, Adenosine-5'- (γ -5-
37 nitropentyl)triphosphate, Adenosine-5'- (γ -isopropyl) triphosphate, Adenosine-5'- (γ -tert-butyl)
38 triphosphate, Adenosine-5'- (γ -methyl)- (γ' -ethyl) triphosphate, Adenosine-5'- (γ -cyclohexyl)
39 triphosphate, Adenosine-5'- (γ -methyl)- (γ' -propyl) triphosphate, Adenosine-5'- (γ -2-propenyl)
40 triphosphate, Adenosine-5'- (γ -3-butenyl) triphosphate, Guanosine-5'- (γ -2-propenyl) triphosphate,
41 Adenosine-5'- (γ -4-pentenyl) triphosphate, Cytosine-5'- (γ -2-propenyl) triphosphate, Adenosine-5'-
42 (γ -5-hexenyl) triphosphate, Thymidine-5'- (γ -2-propenyl) triphosphate, Adenosine-5'- (γ -
43 cyclohexenyl) triphosphate, Uracil-5'- (γ -2-propenyl) triphosphate, Adenosine-5'- (γ -3-
44 propanaldehyde) triphosphate, 3'-azido-3'-deoxythymidine-5'- (γ -2-propenyl) triphosphate,
45 Adenosine-5'-(γ -4-butanaldehyde) triphosphate, 3'-azido-2',3'-dideoxythymidine-5'- (γ -2-propenyl)
46 triphosphate, Adenosine-5'- (γ -3-butanone) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'-
47 (γ -2-propenyl) triphosphate, Adenosine-5'- (γ -2-propynyl) triphosphate, 3'-azido-2', 3'-
48 dideoxythymidine-5'- (γ -2-propynyl) triphosphate, Guanosine-5'- (γ -2-propynyl) triphosphate,
49 Cytosine-5'- (γ -2-propynyl) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'- (γ -2-propynyl)
50 triphosphate Thymidine 5'- (γ -2-propynyl) triphosphate, Uracil-5'- (γ -2-propynyl) triphosphate,
51 Adenosine-5'- (γ -3-butynyl) triphosphate, 3'-azido-3'-deoxythymidine-5'- (γ -2-propynyl)
52 triphosphate, Adenosine-5'- (γ -4-pentynyl) triphosphate, Adenosine-5'- (γ -5-pentynyl) triphosphate,
53 Adenosine-5'- (γ -4-phenyl) triphosphate, Adenosine-5'- (γ - (4 or 6 or 8 acetoxymethyl naphthyl)
54 triphosphate, Guanosine-5'- (γ -4-phenyl) triphosphate, Cytosine-5'- (γ -4-phenyl) triphosphate,
55 Adenosine-5'- (γ - (4-methylpyridyl)triphosphate, Thymidine-5'- (γ -4-phenyl) triphosphate, Uracil-5'-
56 (γ -4-phenyl) triphosphate, Adenosine-5'- (γ - (5-methoxypyridyl)triphosphate, 3'-azido-3'-
57 deoxythymidine-5'- (γ -4-phenyl) triphosphate, Adenosine-5'- (γ - (5-nitropyridyl)triphosphate, 3'-
58 azido-2',3'-dideoxythymidine-5'- (γ -4-phenyl) triphosphate, Adenosine-5'- (γ - (5-
59 acetoxymethylpyridyl) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'- (γ -4-phenyl)

triphosphate, Adenosine-5'- (γ- (6-methyl-1-quinolyl) triphosphate, Adenosine-5'- (γ-4-carboxyphenyl) triphosphate, Adenosine-5'-(γ-(6-methoxy-1-quinolyl)triphosphate, Adenosine-5'-(γ- (4-acetoxymethyl) phenyl) triphosphate, Adenosine-5'- (γ- (4-methyl-1-quinolyl)triphosphate, Adenosine-5'- (γ-4-nitrophenyl) triphosphate, Adenosine-5'- (γ-4-methylphenyl)triphosphate, Adenosine-5'- (γ- (6-nitro-1-quinolyl) triphosphate, Adenosine-5'- (γ-4-methoxyphenyl) triphosphate, Adenosine-5'- (γ- (4-acetoxymethylpyrenyl) triphosphate, Adenosine-5'- (γ-4-ethylphenyl) triphosphate, Adenosine-5'- (γ- (6-methylpyrenyl) triphosphate, Adenosine-5'- (γ-4-butylphenyl) triphosphate, Adenosine 5'-(γ-naphthyl) triphosphate, Adenosine-5'- (γ- (6-ethylpyrenyl) triphosphate, Adenosine-5'- (γ- (4 or 6 or 8 methyl naphthyl)triphosphate, Adenosine-5'- (γ- (6-nitropyrenyl) triphosphate, Adenosine-5'- (γ- (4 or 6 or 8 methoxynaphthyl) triphosphate, Adenosine-5'- (γ-6- (carboxysuccinimidyl fluorescein) triphosphate, Adenosine-5'- (γ- (4 or 6 or 8 nitro naphthyl) triphosphate. Adenosine-5'- (γ-6-carboxymethyl-2, 7-dichlorofluorescein) triphosphate, Adenosine-5'- (γ- (4 or 6 or 8 ethyl naphthyl) triphosphate, Adenosine-5'- (γ-4-phenyl)-(γ'-4 nitrophenyl) triphosphate, Adenosine-5'- (γ- (4 or 6 or 8 butyl naphthyl)triphosphate, Adenosine-5'- (γ-4-phenyl)-(γ'-4 aminophenyl)triphosphate, Adenosine-5'- (γ-methyl) triphosphate, Adenosine-5'- (γ-3-aminopropyl) triphosphate, Guanosine-5'- (γ-methyl) triphosphate, Adenosine-5'- (γ-4-aminobutyl) triphosphate, Cytosine-5'- (γ-methyl) triphosphate Adenosine-5'- (γ-cyclohexyl) triphosphate, Thymidine-5'- (γ-methyl) triphosphate Adenosine-5'- (γ-2-carboxyethyl) triphosphate, Uracil-5'- (γ-methyl) triphosphate, Adenosine-5'- (γ-3-carboxypropyl)triphosphate, 3'-azido-3'-deoxythymidine-5'- (7-methyl) triphosphate, Adenosine-5'- (γ-4-carboxybutyl) triphosphate, 3'-azido-2',3'-dideoxythymidine-5'- (γ-methyl) triphosphate, Adenosine-5'- (γ-2-hydroxyethyl) triphosphate, 2', 3'-didehydro-2', 3'-dideoxythymidine-5'-(γ-methyl)triphosphate, Adenosine-5'- (γ-3-hydroxypropyl) triphosphate, Adenosine-5'- (γ-ethyl) triphosphate, Adenosine-5'- (γ-propyl) triphosphate, Adenosine-5'- (γ-4-hydroxybutyl) triphosphate, Adenosine-5'- (γ-4-butyl) triphosphate, Adenosine-5'- (γ-2-nitroethyl) triphosphate, Adenosine-5'- (γ-hexyl) triphosphate, Adenosine-5'- (γ-3-nitropropyl) triphosphate, Adenosine-5'- (γ-isopropyl) triphosphate, Adenosine-5'- (γ-4-nitrobutyl) triphosphate, Adenosine-5'- (γ-tert-butyl) triphosphate ,Adenosine-5'- (γ-methyl)-(γ'-ethyl)triphosphate, Adenosine-5'- (γ-cyclohexyl) triphosphate, Adenosine-5'- (γ-2-aminoethyl)triphosphate, and Adenosine-5'- (γ-methyl)-(γ'-propyl) triphosphate.

1 **47.(previously presented)** The kit of claim 15, wherein the polymerizing agent is selected from
2 the group consisting of naturally occurring or synthetic polymerases and reverse transcriptases.